



# BUREAU OF AIR POLLUTION CONTROL

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**Facility ID No. A0001**

**Permit No. AP1041-2220**

## MERCURY OPERATING PERMIT TO CONSTRUCT: PHASE 2

**Issued to:** Barrick Cortez, Inc. (HEREINAFTER REFERRED TO AS *THE PERMITTEE*)

**Mailing Address:** HC 66, BOX 1250, CRESCENT VALLEY, NEVADA, 89821-1250

**Physical Address:** HC 66, BOX 1250, CRESCENT VALLEY, NEVADA, 89821-1250

**General Facility Location:** SECTIONS 1, 12 OF T26N, R47E  
 SECTIONS 6, 7 OF T26N, R48E  
 SECTIONS 1, 12 OF T27N, R46E  
 SECTIONS 4-10, 13-18, 23-26, 35, 36 OF T27N, R47E  
 SECTIONS 25, 36 OF T28N, R46E  
 SECTIONS 28-33, T28N OF R47E, MDB&M  
 HYDROGRAPHIC BASIN 54, LANDER COUNTY

**Driving Directions:** THE FACILITY IS LOCATED APPROXIMATELY 38 MILES SOUTH OF INTERSTATE 80, EXIT #261 (BEOWAWE EXIT) ON STATE ROUTE 306.

Emission Unit List: (6 Emission Units)		
<b>A. System 01 – East Electro-winning Circuit (AQOP AP1041-2141: Non-Permit Equipment List - IA1.096), Pregnant Strip Solution Tank (Not Permitted in AQOP AP1041-2141), Barren Strip Solution Tank (Not Permitted in AQOP AP1041-2141)</b>		
TU 4.001	East Electro-winning Circuit	
TU 4.008	Pregnant Strip Solution Tank #19-63-054	
TU 4.009	Barren Strip Solution Tank #19-63-055	
<b>B. System 02 – West Electro-winning Circuit (AQOP AP1041-2141: Non-Permit Equipment List IA1.097)</b>		
TU 4.002	West Electro-winning Circuit	
<b>C. System 03 – Pipeline Refinery Induction Furnaces and Retorts (AQOP AP1041-2141: System 8 – S2.002 and S2.003; and System 9A – S2.005 and S2.006)</b>		
TU 4.003	Refinery Induction Furnace #1	
TU 4.004	Refinery Induction Furnace #2	
TU 4.010	Retort #1	
TU 4.011	Retort #2	
<b>D. System 04 – Pipeline Carbon Reactivation Kilns (AQOP AP1041-2141: System 10 – S2.007 and S2.008)</b>		
TU 4.005	Pipeline Carbon Reactivation Kiln #1	
TU 4.006	Pipeline Carbon Reactivation Kiln #2	



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## Section II. Specific Operating Conditions

C. Emission Units TU4.003, TU4.004, TU4.010 and TU4.011 - location North 4,456.899 km, East 523.905 km, UTM (NAD 83, Zone 11)

C. System 03 – Pipeline Refinery Induction Furnaces and Retorts	
TU 4.003	Refinery Induction Furnace #1, manufactured by Inducto Therm, model #VIP Power Trak-R, serial #80354
TU 4.004	Refinery Induction Furnace #2, manufactured by Inducto Therm. Model #VIP Power Trak-R, serial #59585-6-96
TU 4.010	Retort #1, manufactured by Summit Valley Equipment & Engineering, model #4.5MRIF
TU 4.011	Retort #2, manufactured by Summit Valley Equipment & Engineering, model #4.5 MRIF

#### 1. Air Pollution Equipment

- a. Exhaust gas from **TU4.003, TU4.004, TU4.010 and TU4.011** shall be ducted to a control system with 100% capture consisting of:
  - i. **Mercury Condenser System (MC-001)**, manufactured by Summit Valley Equipment & Engineering, consists of a mercury condenser for each retort followed by a second stage mercury condenser on the combined exhaust streams of **TU4.010 and TU4.011**. System includes a chiller and chilled water holding tank.
  - ii. **Baghouse (BH-001)**, manufactured by Sly Technology, on the exhaust streams of **TU4.003 and TU4.004**.
  - iii. **Sulfur-Impregnated Carbon Adsorption Bed (CA-001)**, manufactured by Scotia International of Nevada, Inc., on the combined exhaust streams of **TU4.003, TU4.004, TU4.010 and TU4.011**
- b. Stack parameters
  - i. Height: 18.0 ft.
  - ii. Diameter: 0.83 ft.
  - iii. Stack temperature: Approximately 100°F
  - iv. Flow: Maximum 1,700 dry standard cubic feet per minute (dscfm).
  - v. Units **TU4.003, TU4.004, TU4.010 and TU4.011** are ducted to a single vertical exhaust stack.

#### 2. Operating Requirements

- a. Limitations of operation. NAC 445B.3679.3.
  - i. The maximum allowable batch weight for **TU4.010 and TU4.011** each will not exceed 750 pounds of precious metal bearing material. Precious metal bearing material shall consist only of the following:
    - (a) Precious metal bearing sludge and precipitate from the electro-winning cells.
    - (b) Paper attached to precious metal bearing sludge and precipitate from the electro-winning cells.
    - (c) Precious metal bearing sludge and precipitate collected from the pregnant and barren tanks.
  - ii. The maximum allowable batch weight for **TU4.003** will not exceed 600 pounds of retorted precious metal bearing material. Retorted precious metal bearing material shall consist only of the following:
    - (a) Precious metal bearing material, as defined in C.2.a.i.(a) through (c) of this section, that has been retorted.
    - (b) Dust collected from the baghouse and fume hood of **TU4.003 and TU4.004**.
  - iii. The maximum allowable batch weight for **TU4.004** will not exceed 400 pounds of retorted precious metal bearing material. Retorted precious metal bearing material shall consist only of the following:
    - (a) Precious metal bearing material, as defined in C.2.a.i.(a) through (c) of this section, that has been retorted.
    - (b) Dust collected from the baghouse and fume hood of **TU4.003 and TU4.004**.
  - iv. **Simultaneous operation of TU4.003 and TU4.004 is prohibited.**
  - v. **The interim mercury emission limit during the demonstration period for establishment of the final mercury emission limit as established in Section II.C.3.e. for TU4.003, TU4.004, TU4.010 and TU4.011 combined shall not exceed  $9.2 \times 10^{-4}$  grains per dry standard cubic foot (gr/dscf).**
  - vi. Hours
    - (a) **TU4.003, TU4.004, TU4.010 and TU4.011** each may operate 24 hours per day.
    - (b) **TU4.010 and TU4.011** each may operate a total of 8,760 hours per calendar year.
    - (c) **TU4.003 and TU4.004** combined may operate a total of 3,000 hours per calendar year.



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## Section II. Specific Operating Conditions (continued)

- C. **Emission Units TU4.003, TU4.004, TU4.010 and TU4.011** - location North 4,456.899 km, East 523.905 km, UTM (NAD 83, Zone 11)
- b. Work practices. NAC 445B.3679.3.
    - i. Carbamate Chemical UNR-811 Mercury Precipitant shall be added to the process solutions in the pregnant ponds and SAG Mill upstream of **System 3** at a minimum rate of 30,000 pounds per month.
    - ii. Retorts (**TU4.010 and TU4.011**)
      - (a) During heating **TU4.010 and TU4.011** shall be placed under negative gauge pressure greater than or equal to 100 mmHg.
      - (b) Precious metal bearing material shall be retorted in pans specified by the retort manufacturer and not exceed the volume capacity specified by the manufacturer, per pan.
    - iii. Mercury Condenser System (**MC-001**)
      - (a) The maximum exhaust gas temperature at the discharge of the second stage condenser of **MC-001** shall not exceed 85°F.
      - (b) The water temperature exiting the chilled water tank feeding **MC-001** shall be maintained at or below 60°F.
      - (c) The water flow rate exiting the chilled water tank feeding **MC-001** shall be maintained at or above 35 gallons per minute.
      - (d) Condensed mercury from **MC-001** shall be collected monthly.
    - iv. Furnaces (**TU4.003 and TU4.004**)
      - (a) After initial startup date of **TU4.010 and TU4.011**, only retorted precious metal bearing material that has been shall be fed into both **TU4.003 and TU4.004**.
      - (b) The Baghouse will be operated at all times, during the operation of **TU4.003 and TU4.004** including startup and shutdown.
      - (c) The pressure differential across **BH-001** shall be maintained within the manufacturer's specified operating range of 0.0 to 5.5 inches of water.
      - (d) Bags in **BH-001** shall be inspected quarterly for damage or leakage.
    - v. Carbon Bed (**CA-001**)
      - (a) **CA-001** shall contain no less than 3,815 pounds of sulfur-impregnated carbon.
      - (b) The pressure differential across **CA-001** shall not exceed 10 inches of water.
      - (c) Sulfur-impregnated carbon from **CA-001** shall be replaced in accordance with the following schedule:
        - 1. Representative carbon samples shall be taken from near the inlet and outlet of **CA-001**. The depth of the sample locations shall be recorded. The percentage of mercury by weight shall be calculated as the average loading from the samples. The loading capacity of the sulfur-impregnated carbon is 20% by weight. Sampling will continue quarterly, at the same sample depth location, until 50% of the carbon loading capacity is reached. Upon reaching 50% of the carbon loading capacity, sampling of the carbon will occur monthly until 90% of the carbon loading capacity is reached. The carbon will be replaced with equivalent performing sulfur - impregnated carbon no later than 30 days after reaching 90% of the carbon loading capacity.
        - 2. The required mercury analysis shall be performed utilizing one of the following methods:
          - a. EPA method 6020-Inductively Coupled Plasma-Mass Spectrometry;
          - b. EPA method 7471B- Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique); or
          - c. An alternative test method as approved by the Director.
      - (d) Any sulfur-impregnated carbon replaced in **CA-001** shall be replaced with only the manufacturer's design specification sulfur-impregnated carbon or an equivalent performance or better carbon.
      - (e) The NvMACT design specifications for the sulfur-impregnated carbon used in **CA-001** shall be kept on site.
      - (f) An ash collector screen must be installed upstream of the carbon bed.

### 3. Compliance Testing, Monitoring, Recordkeeping and Reporting

- a. Compliance Testing NAC 445B.3379.3

Within 180 days of the notification of the implementation of NvMACT for **TU4.003, TU4.004, TU4.010 and TU4.011** as required in Section I.Q., *the Permittee* shall conduct and record a performance test for mercury on the exhaust stack of



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## Section II. Specific Operating Conditions (continued)

C. Emission Units TU4.003, TU4.004, TU4.010 and TU4.011 - location North 4,456.899 km, East 523.905 km, UTM (NAD 83, Zone 11)

TU4.003, TU4.004, TU4.010 and TU4.011 consisting of three valid runs utilizing US EPA Method 29 of 40 CFR Part 60 Appendix A.

b. Monitoring NAC 445B.3379.3

The Permittee shall:

- i. Prior to the implementation of NvMACT install, calibrate and maintain instrumentation to measure and record the following:
  - (a) The negative gauge pressure of TU4.010 and TU4.011, in mmHg.
  - (b) The outlet gas temperature for the second stage condenser of MC-001, in degrees Fahrenheit.
  - (c) The temperature of the water exiting the chilled water tank feeding MC-001, in degrees Fahrenheit.
  - (d) The water flow rate exiting the chilled water tank feeding MC-001, in gallons per minute.
  - (e) The pressure drop across BH-001, in inches of water.
  - (f) The pressure drop across CA-001, in inches of water.
- ii. Prior to commencement of TU4.010 and TU4.011, install, operate, calibrate, and maintain a vacuum interlock that will shut off the retort heating element if the retort gauge pressure is less than 100 mmHg of vacuum.
- iii. Prior to commencement of TU4.010 and TU4.011, install, operate, calibrate, and maintain a condenser water flow interlock which will shut off the retort heating element if condenser water flow is not present.
- iv. Prior to commencement of TU4.010 and TU4.011, install, operate, calibrate, and maintain an exhaust gas temperature alarm which will notify the operator when the exhaust gas from the second stage condenser of MC-001 equals a temperature of 110°F or more.
- v. Prior to commencement of TU4.010 and TU4.011, install, operate, calibrate, and maintain an exhaust gas temperature interlock which will shut off the retort heating element if the exhaust gas from the second stage condenser equals a temperature of 160°F or more.
- vi. Monitor the batch weight of processed material for TU4.003, TU4.004, TU4.010 and TU4.011 each, in pounds, for each batch.
- vii. Monitor the hours of operation for TU4.003, TU4.004, TU4.010 and TU4.011 each during operation, for each batch.
- viii. Monitor the amount of Carbamate Chemical UNR-811 Mercury Precipitant consumed on a monthly basis.
- ix. Monitor the gauge pressure on TU4.010 and TU4.011, continuously per batch during operation.
- x. Monitor the outlet gas temperature of the second stage condenser of MC-001, continuously per batch during operation.
- xi. Monitor the water temperature exiting the chilled water tank feeding MC-001, continuously per batch during operation.
- xii. Monitor the water flow rate exiting the chilled water tank feeding MC-001, continuously per batch during operation.
- xiii. Monitor the mercury drained from MC-001, monthly.
- xiv. Monitor the pressure drop of BH-001, continuously per batch during operation.
- xv. Monitor the pressure drop across CA-001, continuously per batch during operation.
- xvi. Monitor CA-001 for percentage of mercury by weight, quarterly until reaching 70 percent capacity and then monthly until reaching 75 percent capacity.

c. Recordkeeping NAC 445B.3379.3

The required monitoring, established in Section C.3.b.i through Section C.3.xvi., shall be maintained in a contemporaneous log containing, at a minimum, the following recordkeeping:

- i. The calendar date of any required monitoring.
- ii. The batch weight of processed material for TU4.003, TU4.004, TU4.010 and TU4.011 each per batch load, for the corresponding date.
- iii. The total hours of operation for TU4.003, TU4.004, TU4.010 and TU4.011 each per batch load, for the corresponding date.
- iii. The total amount of Carbamate Chemical UNR-811 Mercury Precipitant consumed in pounds for the corresponding month.
- iv. The gauge pressure on TU4.010 and TU4.011, based on a one-hour period, for the corresponding date.



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## Section II. Specific Operating Conditions (continued)

- C. **Emission Units TU4.003, TU4.004, TU4.010 and TU4.011** - location North 4,456.899 km, East 523.905 km, UTM (NAD 83, Zone 11)
- vi. The outlet gas temperature of the second stage condenser of **MC-001**, based on a one-hour period, for the corresponding date.
  - vii. The water temperature exiting the chilled water tank feeding **MC-001** based on a one-hour period, for the corresponding date.
  - viii. The water flow rate exiting the chilled water tank feeding **MC-001** based on a one-hour period, for the corresponding date.
  - ix. The amount of mercury collected from **MC-001**, in pounds, monthly, for the corresponding date.
  - x. The differential pressure drop across **BH-001**, based on a one-hour period, for the corresponding date..
  - xi. The quarterly Baghouse bag inspection results for the corresponding date.
  - xii. The pressure drop across **CA-001** based on a one-hour period, for the corresponding date.
  - xiii. The percentage of mercury by weight in the sulfur-impregnated carbon, for the corresponding date.
  - xiv. The depth of the sample location, for the corresponding date
  - xv. The date and weight of each replacement of the sulfur-impregnated carbon bed.
  - xvi. The original manufacturer's design specifications for the sulfur impregnated carbon used in **CA-001** shall be kept on site.
  - xvii. The manufacturer's specified heating temperature profile for **TU4.010 and TU4.011** shall be kept on site.
  - xviii. The date, time, and corrective action taken for an alarm notification or an interlock shut-down, for the corresponding date.
- d. Reporting NAC445B.3679.3(e)  
*The Permittee* will promptly report to the director any deviations from the requirements of the Operating Permit to Construct. The report to the director will include the probable cause of all deviations and any action taken to correct the deviations. For this Operating Permit to Construct, prompt is defined as submittal of a report within 15 days of said deviation. This definition does not alter any reporting requirements as established for reporting of excess emissions as required under NAC 445B.232 and under Section I.L of this permit.
- e. Performance Testing NAC 445B.3679.2(g)
- i. Upon the notification date of the implementation of NvMACT pursuant to Section I.Q. above, *the Permittee* shall begin a performance demonstration period for the establishment of a mercury emissions limit for **TU4.003, TU4.004, TU4.010 and TU4.011**, which shall consist of (6) consecutive Method 29 source tests at approximate 6-month intervals. **Three tests shall be with TU4.003, TU4.010 and TU4.011 operating simultaneously, and 3 tests shall be with TU4.004, TU4.010 and TU4.011 operating simultaneously.** The performance demonstration period shall provide emissions data for the establishment of a final NvMACT mercury emission limit for **TU4.003, TU4.004, TU4.010 and TU4.011**.
  - ii. *The Permittee* shall submit a test protocol and receive NDEP protocol approval for each performance demonstration test. Performance tests must be performed at conditions that the Director deems representative of normal operations. Only NDEP-validated tests may be used for the establishment of a final NvMACT mercury emission limit for **TU4.003, TU4.004, TU4.010 and TU4.011**.
  - iii. *The Permittee* shall provide in each validated performance test report the records of all operating parameters and work practice standards required in the Phase-2 Mercury Operating Permit to Construct as monitored and recorded during each corresponding test of performance. Material sampling must be performed pursuant to the NDEP approved protocol.
  - iv. Within 30-days of receiving a complete stack test report, the Director shall complete a review of the stack test report and provide written notification to *the Permittee* with determination of applicability for the performance demonstration, pursuant to the NDEP approved test protocol.
  - v. The final NvMACT mercury emission limit shall be calculated as the maximum test value from the (6) corresponding NDEP-validated performance demonstration tests plus one standard deviation in gr/dscf mercury. The standard deviation value shall be calculated from the (6) corresponding NDEP-validated performance demonstration test values.





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**Section II. Specific Operating Conditions (continued)**

- C. **Emission Units TU4.003, TU4.004, TU4.010 and TU4.011** - location North 4,456.899 km, East 523.905 km, UTM (NAD 83, Zone 11)
- vi. The final NvMACT mercury emission limit shall be the applicable mercury emission limit permit requirement for the Phase-2 Mercury Operating Permit to Construct expressed as gr/dscf mercury.
  - vii. A NDEP validated performance demonstration test may be used for the purpose of annual mercury emissions testing.

**\*\*\*\*\* End of Specific Operating Conditions \*\*\*\*\***



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**Section III. Amendments**

02/01/12-PAA: Pursuant to Air Case 12AP0252, applicant requested additional language clarifying the operating conditions and performance testing criteria for System 3: Pipeline Refinery Induction Furnaces and Retorts. Changes clarify that simultaneous operation of the refinery furnaces is prohibited; that the current limit stated in the permit is an interim limit pending satisfactory True-Up/True-Down Performance Testing; and that of the six tests required to determine the final NvMACT Hg emissions limit, three tests will be with furnace #1 and both retorts operating simultaneously, and three tests will be with furnace #2 and both retorts operating simultaneously

**This permit:**

1. **Is non-transferable. (NAC 445B.287.3)**
2. **Will be posted conspicuously at or near the stationary source. (NAC 445B.318.5)**
3. **Any party aggrieved by the Department's decision to issue this permit may appeal to the State Environmental Commission (SEC) within ten days after the date of notice of the Department's action. (NRS 445B.340)**

**Signature**

**Issued by:**

\_\_\_\_\_  
Jeff Kinder

Supervisor

Bureau of Air Pollution Control

**Phone:**

\_\_\_\_\_  
(775) 687-9475

**Date:**

\_\_\_\_\_  
March XX, 2012